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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,944	07/31/2003	Shahriar Ahmed	42P10970D	4969

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EXAMINER

ABRAHAM, FETSUM

ART UNIT PAPER NUMBER

2826

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,944

Applicant(s)

AHMED ET AL.

Examiner

Fetsum Abraham

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 27-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) all is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Final Rejection

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 27-32 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed mask acting a self aligning agent of the recess is neither clear nor definite because the term "agent" can have a lot of meanings ranging from material or conceptual aspects.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1,3,4 ,7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki (6,232,638).

As for claim 1 the patent discloses a structure and method of making the same in fig. 6(b) whereby an emitter stack (214) is formed between first isolation structure (202 on the right side of the active region) and second isolation structure (202 in the left side of the active region), Wherein the isolation regions are isolated from each other by the active region in between, a self aligned recess between the emitter stack and the first isolation structure (right side 202) and a bipolar device between the two isolation structures.

As for claims 3,4, a mask (108) is patterned to expose a portion of the emitter stack where emitter electrode (114) is to be formed in figure 4(a), a portion of the substrate between the first isolation structure and a portion of the emitter stack, and a portion of the first isolation structure (see fig. 3(c)). Then anisotropically etching was performed selectively to form the self-aligned recess that only affects the recessed portion.

As for claim 7, region (105) is an epitaxial layer on the substrate and the polysilicon emitter region is formed on top of it and latter patterned and etched into an emitter layer of the bipolar transistor.

As for claims 8,9,11 following the procedures indicated above, the emitter is provided with spacers (125) (see figure 4(d)) above the collector region of the device.

As for claim 10, a mask is always involved while patterning a given semiconductor region. That also applies to trim the emitter electrode 114 from the overall layer deposited on the substrate surface (see the difference between layer (113) in figures 3(d) and 4(d)).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,5,6,12,27-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki.

As for the above claims the structure shows a self-aligned collector tap (227) in the bottom portion of the recess by diffusion means. However, it would have been obvious for one skilled in the art to form the tap by implantation means since the method is notoriously known in the art as a substitute method to diffusion specifically in regions where depth is an issue.

As far as claim 27 is concerned, so far as understood, the description of the art in relation to claim 1 stands applicable.

As for the stages of implants in claims 6,32 it is clear that the dopant densities of a contact region must increase toward the contact electrode to provide smooth resistance transition between semiconductor layers and metals. Therefore, going from a P—or N—portions of a substrate to the maximum doping density levels defined by P++ and N++ layers is known in the art and has a defining terminology as “graded”. Therefore, it would have been obvious to one skilled in the art to grade a layer by implanting different densities in different stages especially in electrode portions of a given device. (Please see the secondary reference to verify the statement).

As for claims 12,28,31 the collector tap is a buried layer from broader interpretation view. As for claim implanting ions deep into a substrate is a common that aborts better success than diffusion.

As for claims 29,30, region (105) is an epitaxial layer on the substrate and the polysilicon emitter region is formed on top of it and latter patterned and etched into an emitter layer of the bipolar transistor and the claimed method of etching applied.

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As for claims 33,34,36 a mask is always involved while patterning a given semiconductor region. That also applies to trim the emitter electrode 114 with its spacers from the overall layer deposited on the substrate surface (see the difference between layer (113) in figures 3(d) and 4(d)). See also the spacers provided to the emitter electrode.

As for claim 35, the procedure of layer formation in the claim is a duplicate of the prior art.

As for claim 37, the conductor (213) is patterned to be an emitter electrode.

As for claim 38, the buried layer is already discussed above.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki (4,957,875).

As for claim 1 the patent discloses a structure and method of making the same in the front page composed of an emitter stack formed between first isolation structure (36) and second isolation structure (38), Wherein the isolation regions are isolated from each other by the active region in between, a self aligned recess between the emitter stack and the first isolation structure and a bipolar transistor between the isolation structures.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Examiner's answer to applicant's argument

Applicant's argument that the recess (216) of Suzuki is not in the claimed position has been considered but found moot in view of figure 7(b) where it is located between the emitter stack (214) and the first isolation structure (202, in the extreme right of the structure).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fetsum Abraham whose telephone number is: 571-272-1911. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915.

Fetsum Abraham

3/31/05